



FROM THE EDITOR

DR. ANNALISA C CHRISTIE, University of East Anglia

Earlier this year saw the 4th Independent meeting of the ICAZ Archaeomalacology Working Group, which I organised alongside the Association for Environmental Archaeology (AEA) Spring Conference and the Professional Zoo-Archaeologists Group (PZAG) meeting in Orkney. Archaeological evidence for marine resource exploitation was a common theme across the conferences, which all showcased the diversity and density of ongoing archaeomalacological research worldwide. At this meeting I decided to step down both as co-ordinator of the AMWG and as editor of the newsletter, to focus on my post-doctoral research activities on the Cowrie Shells: An Early Global Commodity Project. Daniella Bar Yosef will take over as group co-ordinator; while Cindy Nelson-Viljoen takes over editing the newsletter. The newsletter is only successful because of its contributors, and as such I'd like to thank all those who have submitted to the newsletter over the last few years. There have been some bumper issues that have highlighted the excellent work being produced. I would also like to wish Cindy the very best as she takes over and look forward to reading future issues of the newsletter as it goes from strength to strength.

FROM THE INCOMING EDITOR

CINDY NELSON-VILJOEN, University of Edinburgh

I am delighted to take up the role as editor and I would like to thank, and commend, Annalisa in running the newsletter over the last 4 years. I met Annalisa at the AMWG meeting in Kirkwall this year where I presented my research on seasonal shellfish use. My interest in zooarchaeology started with both my Honours and Master degrees dealing with animal utilization practices during the South African Iron Age. During my time as research coordinator and archaeologist for the Mossel Bay Archaeology Project my duties included coordinating research into the paleoclimate, paleoenvironment, paleoecology, and palaeoanthropology studies on sites along the South African coastline, specifically the Western Cape at sites such as Pinnacle Point. Hence sparking my interest in the exploitation of coastal resources. At present, I am a PhD student at the University of Edinburgh, School of History, Classics and Archaeology, investigating seasonal shellfish use during the Later Stone Age at Pinnacle Point. My aim is to use oxygen isotope and sclerochronological analysis on shellfish to better understand the occupational history of past populations, and the possible seasonal nature of coastal diets.

As the incoming editor, and in line with the mission of the newsletter, I aim to increase publication to two issues a year. With the help of the AMWG community, I hope to circulate regular and informative content related to archaeomalacological matters. I therefore invite contributions in the form of short publications, reports, abstracts or works in progress. In addition to any archaeomalacological related news, developments, conferences, events, opportunities or workshops. The deadlines for submission are **31 January** (for inclusion in the February newsletter), and **31 July** (for inclusion in the August newsletter). Please send all suggestions, questions and contributions for the newsletter to C.Nelsonviljoen@gmail.com. I look forward to working with the AMWG community, and any feedback you may provide in improving the Newsletter.

All opinions expressed in the newsletter are those of the authors and not necessarily those of the editor or online hosts. Current and previous issues of the newsletter are available at <http://archaeomalacology.com>.

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LANDSNAILS IN TANZANIA: CULTURAL USES WITH ARCHAEOLOGICAL IMPLICATIONS

JONATHAN WALZ¹

Archaeologists in East Africa regularly recover land snail shell at sites attributed to ancient communities. Yet, land snails from Holocene archaeological sites have received little attention from scholars. As archaeologists begin to address land snail debris, they should consider the contemporary uses of land snails by Africans. Treating land snail remains as mere residues of the natural environment or as evidence of human subsistence impoverishes other potential meanings of land snail shell in the archaeological record. In this brief report, I note ethnographic observations of land snail uses among African communities who live in lowland northeastern Tanzania. Presently, a diverse group of land snails inhabits the northeast portion of mainland Tanzania (Tanga and Kilimanjaro regions) (Emberton et al., 1997; Tattersfield et al., 1998; Verdcourt, 1952, 1972). The region's mosaic environment includes a coralline coast that abuts the Indian Ocean, the tropical catchment of the Pangani (Ruvu) River, components of the dramatic Eastern Arc Range of mountains, and an arid interior steppe. Human



residents include town dwellers (Swahili), but also subsistence farmers (Zigua, Shambaa, and Pare, all Northeast Coast Bantu speakers) and agropastoralists (Il-Parakuyu; Maa / Eastern Nilotic speakers). There is great diversity in the cultures of these and other local populations. My ethnographic observations of land snail use derive from three years in the coastal hinterland, more than fifty kilometers from the ocean.

FIG. 1: [LEFT] A contemporary example of *A. fulica* employed in alleged witchcraft, compass for scale. (Walz, J. 2003)

My interest in land snails arises from results of systematic archaeological excavations at Kwa Mgogo and Gonja Maore, two sites that date to the late first millennium and early second millennium AD (Walz, 2010). These localities collectively yielded >14 kg of land snail shell (>500 MNI). The majority of identifiable specimens are *Achatina* spp., likely *A. fulica* [The Giant African Landsnail, recently redesignated *Lissachatina fulica*]. The archaeological assemblage includes intact shells as well as fragments with patterned breakage resulting from predation by banded mongoose (*Mungos mungo*) and various rodents, birds, and carnivorous snails (Kasigwa et al., 1983). In addition, and most striking, the assemblage bears a variety of objects fashioned from land snail shell, including small disc beads (>1600, inclusive of all stages of production), larger pierced ornaments of different shapes, spoon-like items, and shallow shell "bowls" with interior residues. *A. fulica* regularly grows to >20 cm (length), 1-2 mm (shell thickness), and >0.5 kg (weight). Its visibility, ease of harvest, and robust shell explain humans' interest in it. Residents in this region collect land snails from agricultural fields, trash middens, and rocky outcrops, localities where *Achatina* spp. congregate. Called *konokono* (sing., Swahili, a general designation for molluscs) and, less frequently, *koa* (sing., Swahili, a more specific designation for large land snails) (Walsh, 2015), I encountered live and deceased examples of the Giant African Land Snail multiple times each day during field surveys. Its natural frequency varies based on season (more common during the rains and immediately thereafter), vegetation and soil types, and the presence of human refuse.

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I observed at least one instance of the following uses of *Achatina* spp., either for its shell or soft parts. Alternatively, I heard about other uses of *Achatina* spp. during multiple conversations with regional residents.

Food

- as famine food (soft parts; not observed, but evident in oral histories and traditions) [Zigua]

Subsistence Tools

- as bait for catching freshwater fish (soft parts) [Zigua and Pare]
- as latches to secure closed freshwater fish traps (modified fragment of specimen) [Pare]
- to scare birds and other pests from fields (multiple, large specimens pierced and hung in contact) [Zigua and Pare]
- to cut stems and detach seeds from grain crops, including varieties of millet (small modified specimens) [Zigua]

Household Tools

- as spoons (modified fragment of specimen) [Zigua, Pare, and Shambaa]
- as containers to carry salt (modified large specimen) [Zigua and Pare]

Landscape Markers

- to mark the locations of hunting traps concealed in vegetation (large specimen pierced and hung in a low bush) [Pare]
- to mark the intersection of two paths where the entrance to one path is hidden (large specimen pierced and hung in a low bush) [Zigua and Pare]
- to mark the boundary of an agricultural field (multiple, large whole specimens equally spaced) [Pare]

Decorations

- as personal adornments (multiple, modified and pierced fragments suspended on a cord) [Zigua, Pare, and Parakuyu]
- to decorate the exteriors of wattle-and-daub residences of elder men (fragments of specimens embedded in daub) [Zigua]
- to adorn human graves (multiple, large whole specimens) [Zigua and Shambaa]

Ritual Implements

- as offerings left at spirit dwellings (large whole specimen) [Zigua and Shambaa]
- to call snakes (by blowing), locally represented as ancestors / nature spirits (modified large specimen; not observed, but evident in oral histories and traditions) [Zigua]
- to conduct healing and witchcraft (multiple, large whole specimens) (Fig. 1) [Zigua, Pare, and Shambaa]

Based on these ethnographic observations (also see Pilsbry, 1919, for Central Africa), archaeologists in East Africa should consider a wider range of interpretations for land snail shell remains from ancient human settlements. For instance, patterning in the modifications of land snail shells may signal particular cultural uses. As always, analogies from the present should be critically applied to the past, as the veracity of analogies depends in part on the context of individual finds and the patterning of occurrences across settings. The specifics of the modern and historical uses of land snails also should motivate actualistic studies and closer attention to the taphonomy of ancient land snail shell middens. Regardless, the eventual application of ethnoarchaeology will inspire transformed and culturally enriched interpretations of *Achatina* spp. and other land snail residues in East Africa.

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CONFERENCE REPORT: 4TH INDEPENDENT MEETING OF THE ICAZ ARCHAEOMALACOLGY WORKING GROUP

ANNALISA C CHRISTIE²

PAPERS AND POSTERS

Attended by over 20 delegates from around the world, the conference aimed to showcase the diverse range of ongoing archaeomalacological research worldwide, providing ample opportunity to discuss options for increasing the standardisation of approaches to taxonomic classification, collection, quantification and analysis of shell assemblages and reporting.

Eighteen papers, two roundtable discussions and one poster were presented over two and a half days. The presentations covered a range of thematic issues – including the socio-cultural uses of shell as raw materials and as having intrinsic social value (Bar Yosef, Christie, Deshpande-Mukherjee, Dilaria, Koren, Ktalav, and Wilkens); the use of shell as part of a subsistence economy (Law, McTavish, Moore) or as paleo-environmental indicators (Fradkin, Milano, and O'Connor), quantitative analysis and scientific approaches (Bosch, Escarzaga, LeGeoff, Nelson-Viljoen); the challenges of accurate taxonomy (Moore) and the importance of standardised sampling strategies for curation (Campbell).

The papers demonstrated the global reach of the group documenting ongoing research in the USA, Europe, Africa, the Middle East and around the Indian Ocean.

FIELDTRIPS

Two fieldtrips were arranged as part of the conference. On the Tuesday (6th April), delegates visited the site of an eroding shell midden providing a focal point for discussion of sampling strategies and cost effective ways in which the midden (and other similar sites) could be examined ahead of its impending destruction from the sea. During this trip delegates also visited Deerness and the wartime heritage at the Churchill Barriers.

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The second fieldtrip showcased the wealth of cultural heritage in Orkney. Delegates visited the Skara Brae, the Stones of Stenness, the Ring of Brodgar, Barnhouse, Maeshowe, the Broch of Birsay and the Broch of Gurness. As part of this, there was ample opportunity to look for the elusive 'Groatie Buckie' at Birsay.

POINTS OF INTEREST

The conference allowed plenty of time for discussion with two, ninety minute roundtable discussions. The first session focussed on taxonomy, taphonomy and methodological approaches to understanding the socio-cultural uses of shell. The second roundtable explored quantitative analyses in more detail, as well as providing opportunities to discuss issues raised by Campbell's paper 'Someone Had To Be First' – an attempt at standardising shell assemblage sampling, classification and archiving. One theme common to both sessions centred on which were the best sources for shell classification. The group would like to create an annotated bibliography of sources for identification, as well as an accessible database of sources related to relevant archaeomalacological themes.

During the Working Group meeting Dr Christie stood down as co-ordinator of the group after four years, this will be taken over by Dr Daniella Bar Yosef in the interim. Dr Christie also stepped down as editor of the Archaeo + Malacology newsletter handing it over to Cindy Nelson-Viljoen.

FORTHCOMING MEETINGS:

The next meeting of the AMWG will be via a session/sessions at the ICAZ meeting in Ankara in 2018.

RECENT PUBLICATIONS

GALILI, E., ŞEVKETOĞLU, M., SALAMON, A., ZVIELY, D., MIENIS, H.K., ROSEN, B., MOSHKOVITZ, S. (2015). Late Quaternary beach deposits and archaeological relicts on the coasts of Cyprus, and the possible implications of sea-level changes and tectonics on the early populations. In: Harff, J., Bailey, G., Lüth, F. (eds), *Geology and archaeology: submerged landscapes of the continental shelf*. London, Geological Society of London, Special Publications 411, <http://doi.org/10.1144/SP411.10>.

Late Pleistocene beach deposits at 22 selected coastal sites around Cyprus were used to demonstrate vertical changes in the earth's crust over the last 125 ka. These beach and shallow marine deposits were observed on abraded coastal cliffs at 3-22 m above the present sea level. Seventy-six molluscan taxa were identified in these deposits and these are tabulated together with their general distribution and present-day habitat. They include the Senegalese marine gastropods *Persististrombus latus*, *Bursa granularis* and *Conus ermineus* that are no longer found in the Mediterranean and which are index fossils for the Marine Isotope Stage (MIS) 5e in the Mediterranean. The results suggest an uplift of up to 15.5 m over about the last 125 ka. While the maximal uplift since the early Holocene has been minor, not exceeding 1.2-1.5 m, the sea level changes in contrast have reached 40-50 m. These findings are in accordance with the elevation of Holocene beach rocks, abrasion platforms, wave notches and Roman/Byzantine fish tanks, and have enabled the reconstruction of the coast encountered by the early island colonisers. Pre-Pottery Neolithic settlements founded some 10 ka BP on the north (Akanthou) and west (Mylouthkia) coasts have since experienced a sea level rise of about 40 m. Both sites are associated with freshwater springs and Mylouthkia boasts the earliest known wells, dug to exploit the local coastal aquifer above the impermeable Pliocene marls.

GALINDO, L., PUILLANDRE, N., UTGE, J., LOZOUET, P., BOUCEHT, P. (2016). The phylogeny and systematics of the Nassariidae revisited (Gastropoda, Buccinoidea). *Molecular Phylogenetics and Evolution*, 99: 337-353.

Nassariidae are a group of scavenging, predominantly marine, snails that are diversified on soft bottoms as well as on rocky shores, and are the subject of numerous research papers in ecology, ecotoxicology or paleontology. A weak and/or apparently continuous variation in shell characters has resulted in an intimidating taxonomy, with complex synonymy lists. Over 1320 extant nominal species have been described, of which 442 are currently regarded as valid. Above species level, the state of the art is equally hazy, with four subfamilies and twelve genera currently accepted, and many other names in the graveyard of synonymy. A molecular analysis based on three mitochondrial (COI, 16S, 12S) and two nuclear (28S, H3) markers was conducted. Our dataset includes 218 putative nassariid species, comprising 9 of the 12 valid genera, and 25 nominal genera represented by their type species. The monophyly of the Nassariidae as classically construed is not confirmed. Species of *Antillophos*, *Engoniophos*, *Phos*, *Nassaria*, *Tomlinia* and *Anentome* (formerly considered *Buccinidae*) are included inside the Nassariidae clade. Within the Nassariinae, the tree unexpectedly demonstrates that species from the Atlantic and the Indo-Pacific form different clades which represent several independent diversification events. Through an integrative approach, the reconstruction of ancestral states was addressed for eight characters supposedly informative for taxonomy. Using numerous fossil calibration points, Nassariidae appear to have originated 120 MYA ago in Atlantic temperate waters during the Lower Cretaceous. Our results have a profound impact on nassariid taxonomy, especially with regard to the validity of subfamily- and genus-level names.

GLASSOW, M., SUTTON, E.A., FERNANDEZ, C.F., THAKAR, H.B. (2016). Proxy Measurements of California Mussel Valve Length. *Advances in Archaeological Practice*, 4(1): 31-40.

Archaeologists studying shell assemblages from prehistoric sites along the Pacific coast of North America have been interested in the influences of collecting intensity and environmental variability on California mussel (*Mytilus californianus*) size. To determine the variation in mussel size within a shell assemblage, researchers have developed a variety of proxies of mussel valve length based on measurements of morphological features occurring at or near the valve's umbo. We propose four additional measurements that can serve as proxies and evaluate their correlation with valve length using regression analysis. Of the four, anterior adductor scar length has the strongest correlation, and we present two examples of its application. We also evaluate a popular visual technique based on a set of outline drawings of valves of varying lengths, and we found that it systematically underestimated valve length but could be useful under certain circumstances. We conclude that the selection of a particular proxy of mussel valve length depends on the nature of the mussel shell assemblage being studied and the research context.

JERARDINO, A., FAULKNER, P., FLORES, C. (2016). Current methodological issues in archaeo-malacological studies. *Quaternary International* <http://dx.doi.org/10.1016/j.quaint.2016.05.015>

Current research into the origins of coastal economies show that aquatic environments and the resources they contain have played a significant role in human evolution since at least 160 ka, and even more so throughout periods of later cultural development worldwide (Erlandson and Fitzpatrick, 2006; Marean et al., 2007; Cortes-Sanchez et al., 2011; Jerardino, 2016b). Although the study of shell-bearing sites dates

to almost the beginnings of world archaeology (Waselkov, 1987; Claassen, 1998), over the last several decades, and in particular with the currently fast-growing interest in these types of deposits, there has been an increased demand for improved methodologies in order to make sense of the considerable array of evidence derived from such research and to facilitate intra- and inter-assemblage comparisons on a quantitative basis. Since shells often form the dominant archaeological component of ubiquitous shell-bearing sites around the world's coasts and waterways, Archaeomalacology has developed as a sub-disciplinary area dedicated to study these remains in all their multiple facets (i.e., spatial distribution, retrieval, characterization, documentation, quantification and preservation) (Waselkov, 1987; Claassen, 1998). This special issue thus brings together updated and relevant case studies focusing on important methodological aspects in contemporary archaeomalacological research. These case studies reflect a broad geographical range (northern and southern Africa, Australia, North, Central and South America and Europe) along the shorelines of several large oceans (Mediterranean Sea, the northern and southern extensions of the Pacific and Atlantic Oceans) and the restricted riverine and relict freshwater lake systems of southern Australia and the United States. An array of different perspectives and analytical approaches are applied to scrutinise archaeological sequences of different time depths (Pleistocene and Holocene), and in some case studies presented here, the use of modern ecological and experimental data as an important component of the research is also evaluated. These efforts not only contribute towards enhancing our ability to reconstruct the human past (i.e., subsistence, foraging behaviour, technology, palaeoenvironment, site formation and taphonomy) but also provide tools to enable effective management of our cultural heritage around the world.

KENNETH D. THOMAS. (2015) Molluscs emergent, Part I: themes and trends in the scientific investigation of mollusc shells as resources for archaeological research. *Journal of Archaeological Science*, 56: 133-140.

The second most diverse phylum in the animal kingdom, the Mollusca occur in virtually all the environments which are either occupied or exploited by humans. The study of mollusc remains in archaeology has a long history, but the last 10e15 years has witnessed a proliferation of such studies, accompanied by a diversification both in the methods employed to analyse mollusc shells and the research questions they can help address. The analysis of shells of molluscs from archaeological contexts can potentially inform about the environmental, chronological, subsistence, behavioural and social contexts of people in the past; the latter three aspects being considered in Part II (Thomas, 2015). The principal research themes discussed in Part I are: palaeoenvironmental reconstruction; sclerochronology and sclerochemistry; radiocarbon dating of marine mollusc shells, the selection of shells for dating and calibrating the dates; and amino acid racemization dating. The focus is on current research themes and recent published output which are considered with a view to possible future developments.

KENNETH D. THOMAS. (2015) Molluscs emergent, Part II: themes and trends in the scientific investigation of molluscs and their shells as past human resources. *Journal of Archaeological Science*, 56: 159-167.

Recent work in three major research themes involving molluscs is reviewed: 1. molluscs in past human diets and subsistence systems, sclerochemistry and seasonality studies on mollusc harvesting times using stable isotopes of oxygen; 2. the impact of foraging on mollusc populations, resource management strategies, and settlement patterns and mobility of coastal foragers; and 3. mollusc shells as artefacts and personal ornaments, including manufacture and use, provenance studies and exchange systems, and

human cognition. Most of the discussion is about marine molluscs and their shells, although land snails and freshwater shells are also considered, where appropriate.

KETMAIER, V., GLAUBRECHT, M. (2015). The legacy of the Crusaders: complex history of colonization and anthropochory in the land snails *Levantina* (Gastropoda, Pulmonata) in the Eastern Mediterranean. *Zoosystematics and Evolution*, 91 (1): 81-89.

The Eastern Mediterranean land snails *Levantina* display a disjunct distribution spanning the Middle East (Levant), Cyprus, a few locations along the Aegean Turkish coast between Bodrum and Datça, and the islands of Rhodes, Karpathos and a few surrounding islets (Dodecanese). These land snails are strictly bound to limestone; shell variability is noticeable with a pair of umbilicate and non-umbilicate forms parapatrically distributed in the Levant and along the Aegean Turkish coast; they overlap on the Dodecanese islands. We sequenced fragments of two mitochondrial genes (Cytochrome Oxidase I and 16S rRNA) from the historical *Levantina* material available at the Museums of Hamburg and Berlin. The aim of the study is to explain the current distribution of *Levantina* in the Eastern Mediterranean in light of an earlier hypothesis suggesting anthropochory due to the movements of Crusaders across the area. The deeper nodes in our phylogeny indicate that *Levantina* reached the Dodecanese from continental Turkey during the Pliocene exploiting continuity of landmasses. In five circumstances the same haplotype co-occurs on two different islands; one haplotype is shared between one island (Rhodes) and the Levant. We suggest that the movements of the Crusaders likely explain the current distribution of haplotypes. In particular, the Knights Hospitaller of St. John occupied Cyprus, the Dodecanese and the facing Turkish coasts for more than two centuries (1306-1522) after they withdrew from Jerusalem in 1187 and from the Levant in 1291. Snails could have been introduced as an item of food or transported with other material including limestone used for building.

KRAHTOPOULOU, A., VEROPOULIDOU, R. (2016). Late Pleistocene-Holocene shoreline reconstruction and human exploitation of molluscan resources in northern Pieria, Macedonia, Greece. *Journal of Archaeological Science: Reports* <http://dx.doi.org/10.1016/j.jasrep.2016.02.003>.

Zooarchaeological freshwater mussel remains provide information about past environments, faunal communities, and human behaviors. However, one challenge of using archaeological assemblages of animal remains is differential preservation such that bones and shells of some taxa are more vulnerable to processes that destroy or remove them from the record over time. Thus, remains of some species of freshwater mussels may be underrepresented in terms of presence/absence data as well as abundance compared to the life or death assemblages. Evaluating the representativeness of assemblages before using such data to answer zooarchaeological and paleozoological research questions is common practice in archaeology, particularly for vertebrate remains. However, little research has focused on evaluating representativeness for molluscan assemblages. In this paper, three processes that potentially influence archaeomalacological data are addressed: mussel life history strategies, shell identifiability, and shell robusticity. Expectations about taxonomic abundances in unionid zooarchaeological assemblages are framed and assessed using two datasets from sites from the Leon River in central Texas. As expected, shell robusticity and identifiability influence zooarchaeological abundance data; differences in life history strategy can be used to interpret past stream environments. The expectations derived in this paper can be used as interpretive tools for understanding factors that influence archaeomalacological taxonomic abundance data.

MARDER, O., BITON, R., BOARETTO, E., FEIBEL, C.S., MELAMED, Y., MIENIS, H.K., RABINOVICH, R., ZOHAR, I., SHARON, G. (2015). Jordan River Dureijat – a new Epipalaeolithic site in the Upper Jordan Valley. *Journal of the Israel Prehistoric Society*, 45: 5-30.

Jordan River Dureijat is an Early Epipalaeolithic (Kebaran) site on the banks of the Jordan River south of its outlet from the Hula Valley. It has been radiocarbon dated to between 14,000 and 15,000 Cal BC. This paper presents the results of a survey and test excavation carried out in the summer of 2002. The sediments showed exceptional preservation of organic remains and yielded a wealth of environmental data. About 18,000 individual land and freshwater molluscs were recovered from the sediments, comprising 22 (18 gastropod and four bivalve) genera and 47 (38 gastropod and nine bivalve) species. At least 22 species are now extinct in Israel. Such species richness indicates the presence of several different habitats in the vicinity of the site, including lacustrine and fluvial environments. Only three species were identified as terrestrial; the rest were freshwater molluscs. The most abundant species was *Heleobia longiscata*, representing 29% of the total assemblage. All the samples contained embryonic and juvenile specimens of different species, including egg capsules of the genus *Theodoxus* (either *T. michonii* or *T. jordani jordani*) which were found in broken shells of *Melanopsis* spp.

POPEJOY, T., WOLVERTON, S., NAGAOKA, L., RANDKLEV, C.R. (2016). An interpretive framework for assessing freshwater mussel taxonomic abundances in zooarchaeological faunas. *Quaternary International* <http://dx.doi.org/10.1016/j.quaint.2015.09.101>.

Zooarchaeological freshwater mussel remains provide information about past environments, faunal communities, and human behaviors. However, one challenge of using archaeological assemblages of animal remains is differential preservation such that bones and shells of some taxa are more vulnerable to processes that destroy or remove them from the record over time. Thus, remains of some species of freshwater mussels may be underrepresented in terms of presence/absence data as well as abundance compared to the life or death assemblages. Evaluating the representativeness of assemblages before using such data to answer zooarchaeological and paleozoological research questions is common practice in archaeology, particularly for vertebrate remains. However, little research has focused on evaluating representativeness for molluscan assemblages. In this paper, three processes that potentially influence archaeomalacological data are addressed: mussel life history strategies, shell identifiability, and shell robusticity. Expectations about taxonomic abundances in unionid zooarchaeological assemblages are framed and assessed using two datasets from sites from the Leon River in central Texas. As expected, shell robusticity and identifiability influence zooarchaeological abundance data; differences in life history strategy can be used to interpret past stream environments. The expectations derived in this paper can be used as interpretive tools for understanding factors that influence archaeomalacological taxonomic abundance data.

RIDOUT-SHARPE, J. (2015) Changing lifestyles in the northern Levant: Late Epipalaeolithic and early Neolithic shells from Tell Abu Hureyra. *Quaternary International*, 390: 102-116.

The shell assemblage from Abu Hureyra crosses the divide between foraging and farming and provides an opportunity to explore changes in the exploitation and cultural uses of molluscs as ornaments and food over this seminal period in the northern Levant. Shell ornaments in the Late Epipalaeolithic support an underlying link with the Natufian culture, tempered with influences from elsewhere. The acquisition

of Nassarius shells and the use of heat treatment and ochre to colour the beads are vestiges of a more ancient tradition. The influx of ready-made cowry beads from the Red Sea after the mid-Middle PPNB suggests stronger links with the southern Levant while obsidian imports from Anatolia continued to increase. Wear on the beads has provided some insights into their possible use. The seasonal exploitation of freshwater mussels as a dietary supplement may have increased towards the end of the Late Epipalaeolithic. The assemblage from Abu Hureyra is discussed in relation to other sites in the northern Levant to illustrate some of the economic and social changes that took place during the Epipalaeolithic-Neolithic transition.

RIGAUD, S., GUTIÉRREZ-ZUGASTI, I. (2016). Symbolism among the last hunter–fisher–gatherers in northern Iberia: Personal ornaments from El Mazo and El Toral III Mesolithic shell midden sites. *Quaternary International*, 407: 131-144.

L. obtusata and *Trivia* sp. shells were systematically used for personal ornamentation by groups who occupied northern Iberia during the Mesolithic. The shells from El Mazo and El Toral III (Asturias, Spain) offer a unique opportunity for investigating raw material procurement, selection strategies, and manufacture processes developed by Asturian Mesolithic societies for beads production. By combining taphonomic, morphometric, and microscopic analyses, our results show that the shells were introduced and transformed in the caves. Mollusk consumption at the sites and bead manufacture indicate that the sites were occupied for both economic and symbolic purposes. The use of similar shell beads by contemporaneous societies located in different environments (coastal and interior) and relying on drastically different subsistence strategies mirrors the complex circulation network developed by Mesolithic foraging societies.

ZANGRANDO, A.F., VARGAS, G.P., TIVOLI, A.M. (2016). Decreased foraging return in shellfishing? Species composition and shell size of blue mussel (*Mytilus edulis*) from a Late Holocene site of the South Coast of Tierra del Fuego. *Quaternary International* <http://dx.doi.org/10.1016/j.quaint.2015.12.077>.

This paper presents a systematic analysis of the shellfish assemblages recovered from Heshkaia 35, an archaeological site located in the southern tip of South America. Possible arguments concerning to environmental variations and resource depression are considered in an attempt to explain taxa composition and shell size. Results are also discussed in light of expectations based on optimal foraging models and taking into account other factors beyond biological parameters. Shellfishing activities were focused on small mussels, with statistical significant changes in mean shell size along the archaeological sequence of the site. Current knowledge about past variations in sea surface temperature does not seem to explain changes in shell size. Gathering of small mussels appears to be the corollary of resource depression at a local scale. This interpretation reinforces arguments that foraging decisions would have derived from territorial packing on the southeastern coast of Tierra del Fuego during the Late Holocene.

CALL FOR PAPERS

SHELL BEADS OF EASTERN AMERICA

This volume will feature studies of ancient shell beads from Eastern North America. Surveys and analytical studies of the archaeological record of a site, a state, a culture, a species, or depositional pattern are sought. Please contact the editor to discuss your idea. The papers will be due March 1st, 2017. Editor Cheryl Claassen, claassencp@appstate.edu. Examples of papers:

- shell beads from Paleoindian contexts
- a history of columella bead production
- shell beads in Texas
- the temporal and spatial distribution of Leptoxis beads
- shell beads from Ozark rockshelters

FORTHCOMING CONFERENCES

SOCIETY FOR AMERICAN ARCHAEOLOGY (SAA) 82ND ANNUAL CONFERENCE

VANCOUVER, BRITISH COLUMBIA, CANADA

MARCH 29 – APRIL 2, 2017

After the recent ICAZ Stable Isotopes in Zooarchaeology meeting and the International Sclerochronology conference, a session has been proposed for the 2017 SAA conference in Vancouver on advances in the archaeological analysis of hard tissues. If you have questions, or would like to submit an abstract, please email Christine Bassett by August 15, 5:00PM EST to cbassett@crimson.ua.edu.

Abstract: Recent advances in the microscopic and geochemical study of biological hard tissues have broadened archaeological understandings of past human-environmental dynamics, especially in island and coastal settings. Hard tissues that contain macro- and micro-incremental growth structures, such as fish otoliths, corals, coralline algae, teeth, and shells serve as ideal proxies as they record local environmental conditions in their structures as they grow. In addition to past environmental information, the analysis of hard tissues reveals insights into changes to animal populations from climatic stress, as well as resource depletion. When combined with ancillary archaeological evidence, these data can provide new insights into seasonality, sea surface temperature and palaeosalinity, in addition to understanding both long- and short-term patterns of landscape and resource use. This session highlights the interdisciplinary nature of this research, connecting archaeologists, biologists, geochemists and sclerochronologists, to share their latest research and methods in hopes of propelling and strengthening future archaeological investigations of hard tissues.

Website <http://saa.org/AbouttheSociety/AnnualMeeting/tabid/138/Default.aspx>

Submission until 8 September 2016.

**IBERIAN ZOOARCHAEOLOGY MEETING, IN ASSOCIATION WITH THE 5TH IBERIAN PENINSULA ARCHAEOMALACOLOGY
SCIENTIFIC MEETING**

UNIVERSIDADE DO ALGARVE, FARO, PORTUGAL

26-29 APRIL 2017

We kindly invite you to the first Iberian Zooarchaeology Meeting (Encontro de Zooarqueologia Ibérica – EZI2017), in association with the 5th Iberian Peninsula Archaeo-malacology Scientific Meeting (5ª Reunião Científica de Arqueomalacologia da Península Ibérica – 5RCAPI). This is a joint effort of two events developing zooarchaeological themes: one with a broader subject, another focused mainly on archaeomalacological materials. Both meetings will be held at the University of Algarve (Campus de Gambelas), Faro, Portugal, from April 26th to 29th of 2017.

Abstract for the Fifth Iberian Peninsula Archaeomalacology Scientific Meeting – 5RCAPI

Inaugurated in 2010, the RAPI already has a long tradition in the study of mollusks, echinoderms and crustaceans in an archaeological context. This meeting has valued interdisciplinary sharing since the beginning, assembling researchers from prehistory, history, zooarchaeology, archaeology, biology and more. RAPI will now be in its 5th edition—and is the first one to be held in Portugal. Oral presentations and posters submitted to 5RCAPI should focus on Iberian materials or sites, with the exclusion of presentations that are mainly theoretical or methodological. The main topics to address are:

- Theory and methods in archaeomalacology.
- Archaeomalacology studies (monographic, regional or macroregional)
- Mollusks as paleoenvironmental proxy.

Website: <http://ezi2017faro.wix.com/ezi2017en>

Submission until 1 October 2016.
